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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,120	11/14/2001	Ronald Hilton	AMDH-08157US0 DEL	4631

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EXAMINER	
SAXENA, AKASH	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 04/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/992,120	HILTON, RONALD	
	Examiner	Art Unit	
	Akash Saxena	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1-17/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-6 have been presented for examination based on the application filed on 14th November 2001.
2. Claims 1 & 6 were amended to overcome 35 USC 101 rejection presented in previous office action by an amendment submitted on 10th February 2006.
3. The arguments submitted by the applicant have been fully considered. Claims 1-6 remain rejected. The examiner's response is as follows.

Response to Applicant's Remarks & Examiner's Withdrawals

1. Examiner withdraws the claim rejection(s) under 35 USC § 101 to claim(s) 1-6 in view of the amendment presented by applicant on 10th February 2006.
2. Examiner withdraws the claim rejection(s) under 35 USC § 102 to claim(s) 1-2, 4 & 6 in view of applicant's arguments.
3. Examiner withdraws the claim rejection(s) under 35 USC § 103 to claim(s) 3 & 6 in view of the applicant's arguments. Although the arguments presented in response to these rejections are moot, they are considered in making the new rejection under the new 35 USC § 102 & 35 USC § 103 presented below.
4. Further, response to claim interpretation is made below.

Response to Applicant's Remarks Claim Interpretation

5. Applicant has argued that "program mode of operation" as interpreted by the examiner, is stored in the PSW and control registers in IBM S/390 architecture, is an interpretation believed to in error.

Examiner would like to point out that in specification that PSW and control register store "*program execution" information* (Specification: [0027]). Further, program event recorder (PER) is enabled by PSW and control registers (Specification: [0030]). The PER directly influences the generation of STATE word (Specification: [0033]-[0035]). Further, PSW decides the various state variants having modes (which determine program execution mode) such as DAT mode, AS mode etc (Specification: last and most important [0040]).

Further, applicant has presented contradictory arguments, as follows. In remarks (2.2 and 4.2.2) applicant has stated:

> 2.2 To the extent that the Examiner's interppretation is understood, it is believed in error. ***As described in the Specification (Page 6-7 (0027j), the PSW and control register information changes from time to time during execution.*** The particular PSW information when legacy code is first translated to translated code may have first values, but when that legacy code again appears for execution a second time, the PSW information will have second values with no guarantee that the second values are the same as the first values. If different, execution of the already translated code based upon the PSW information second values will lead to incorrect execution since the translated code was based on PSW information first values. ***Accordingly, the required information for proper execution of the translated code is nowhere stored in the PSW and control registers.***
>
> 4.2.2 From the specification, and particularly the quotes in Section 4.2. 1 above, "program execution mode" in the present application is referring to the overall architectural mode of the computer as it relates to programs being executed. ***These program execution modes are set, for example in the S/390 architecture in the Program Status Word (PSW),*** and are not decipherable by inspecting the individual instructions or any instruction state information used for individual instructions.

This appears to be circular reasoning because the architecture under discussion is S/390 in the specification and it can not be asserted both ways that PSW does and

does not store the program execution information to make argument against two separate issues using same architecture. Further, the second argument reinforces the examiner's argument for PSW storing program execution information.

Further, as evidentiary support, please see U.S. Patent No. 5,577,231 issued to Scalzi et al. Col.8 Lines 41-55.

> The source state indicators, which are generated by the source storage address generation process in the target processor, indicate the current operating state defined by the source architecture (being emulated in the target processor) of the executing program. The contents of the source state indicators are defined by the different source access authorization mechanisms defined in the source architecture, which for example may be the IBM S/390 architecture. The S/390 architecture defines access authorization constraints, which use hardware registers and fields in processor real storage for containing indications representing the current access states representing the environment of the executing source program. In the S/390 architecture, the current operating state is indicated by the contents of a PSW (program status word), control registers (CRs), general registers (GRs), associated access registers (ARs), and real storage keys.

Examiner believes, the specification, arguments presented and evidentiary support clearly teaches the relationship between the "program mode of operation" and PSW and control registers. Applicant's arguments are unpersuasive.

Response to Applicant's Remarks for 35 U.S.C. § 102 and 103

6. Although the arguments presented in response to these rejections are moot, they are considered in making the new rejection under the new 35 USC § 102 presented below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 1-3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,577,231 issued to Scalzi et al (Scalzi hereafter).

Regarding Claim 1

Scalzi teaches (Original) method for dynamic emulation of legacy instructions of a legacy program (Scalzi: Col.13 Lines 26-41) by providing state information for determining a program execution mode for emulating said legacy instructions (Scalzi: Col.5 Lines 18-20, Col.8 Lines 41-45); accessing said legacy instructions and said state information (Scalzi: Col.8 Lines 21-40, 57-61) and for each particular legacy instruction, querying to determine if one or more particular translated instructions for said execution mode are stored as a result of translating said legacy instruction for said execution mode (Scalzi: Col.9 Lines 32-62), and if not translated for said execution mode, translating the particular legacy instruction into one or more particular translated instructions for emulating the particular legacy instruction for said execution mode (Scalzi: Col.6 Lines 6-59 – dynamic address translation (DAT) process checking the page table; Col.), *storing said one or more particular translated instructions with said state information* as storing the target address and state information associated to source code in target virtual address which is associated

to translated code (Scalzi: Col.7 Lines 26-31; Col.8 Lines 58-Col.10 Lines 8), and if translated for said execution mode, continuing without additional translating (Scalzi: Col.11 Lines 12-15 – presence of valid page table entry (PTE) indicates already translated source code with state information and execution continues if valid PTE is found in the PT as detailed in Scalzi: Col.9 Lines 32-62), accessing said one or more particular translated instructions for emulating said legacy instructions for said execution mode (Scalzi: Col.11 Lines 44-64).

Regarding Claim 2

Scalzi teaches storing of the one or more particular translated instructions is in one or more particular translated blocks and said state information is stored in each of said particular translated blocks as page frames (Scalzi: Col.6 Lines 6-30) as DAT based translation and exploded virtual target effective address (VEA) (Scalzi: Col.9 Lines 32-62; Col.24 Lines 55-65).

Regarding Claim 3

Scalzi teaches legacy (source) instructions are for a legacy system having a S/390 architecture (Scalzi: Col.9 Lines 13-21).

Regarding Claim 5

Scalzi teaches translated instructions are for execution in a RISC architecture (Scalzi: Col.9 Lines 13-21).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 4 & 6 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,577,231 issued to Scalzi et al (Scalzi hereafter), further in view of U.S. Patent No. 6516295 issued to George A. Mann et al (Mann hereafter).

Regarding Claim 4

Teachings of Scalzi are shown in claim 1 rejection above. Scalzi is indifferent in teaching that legacy instructions are *object code instructions* compiled/assembled for a legacy architecture (Scalzi: Col.5 Lines 14-28 & Background - high level translation trivial, binary translation of object code has limited applicability). Although, his indication is clear that high-level source code translation is trivial (Col.2 Lines 1-8) and object code translation though binary translation does not reproduce access-storage-authorization mechanism - state based (Scalzi: Col.2 Lines 27-33).

Hence although not explicitly, Scalzi indirectly teaches object code based translation with accompanying state information.

Mann explicitly teaches legacy instructions are *object code instructions* compiled/assembled for a legacy architecture (Mann: Col.2 Lines 44-51).

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of Mann to Scalzi. Scalzi is concerned with correct state information porting while performing translation of the legacy information is major concern, source instruction code to target instruction code translation is not a specific concern which is a understood as known in art (Scalzi: Col.5 Lines 26-28). The *source instruction code to target instruction code translation* teaching is supplemented by teachings of Mann. The motivation to combine would have been that both correct state information with address translation information (taught by Scalzi) and instruction code translation (taught as DOCT by Mann Col.2 Lines 44-51) are absolutely essential for correct legacy S/390 object code to target RISC based code translation.

Regarding Claim 6

Claim 6 discloses similar limitations as claim 1 and is rejected for the same reasons as claim 1. Preamble of claim 6 presents added limitation related to legacy code to be in object code format of the source. Mann shows this teaching in claim 4 rejection above.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akash Saxena whose telephone number is (571) 272-8351. The examiner can normally be reached on 9:30 - 6:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini S. Shah can be reached on (571)272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Friday, March 24, 2006

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